

REMARKS

Claims 1-3, 5-10, 13-15 and 18-20 are pending in the present application. Claims 1, 3, 9 and 10 have been amended. Claims 1, 9 and 10 have been amended to incorporate the subject matter of claims 4 and 11. Claim 9 has also been amended to be in independent form. Consequently, claims 4 and 11 have been cancelled herein. No new matter has been added by way of the present claim amendments.

Applicants respectfully submit that the present response does not raise any new issues that would present the Examiner with the burden of additional search and/or consideration. For instance, Applicants are simply amending the claims to incorporate the subject matter of those claims which are free of prior art. Additionally, the presently submitted evidence further supports the patentability of the present invention. In the event that the present submission does not place the application into condition for allowance, entry thereof is respectfully requested as placing the application into better form for appeal.

Enclosed 37 CFR § 1.132 Declaration

Applicants submit herewith a **Declaration Under 37 C.F.R. § 1.132 by Zembei MEIWA**. Mr. Meiwa's enclosed Declaration demonstrates the superiority in stiffness ratio and bulk ratio when using a cationic starch instead of an amphoteric starch. It is clear from Table 5 of the declaration, and particularly, the column "Performance of manufactured paper" that those examples containing cationic starch perform far better than those with amphoteric starch. The Examiner is respectfully requested to review Mr. Meiwa's enclosed declaration in conjunction

with the amendments and remarks submitted herein, since it strongly supports the non-obviousness of the instant invention over the cited art of record.

Claim Objection/Rejection under 35 U.S.C. § 112

Claim 9 is objected to as failing to further limit the subject matter of a previous claim. Claim 9 also stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

The Examiner has pointed out that claim 9 does not further limit claim 1 because it contradicts claim 1. In response, Applicants have amended claim 9 to be in independent form. Thus, Applicants submit that the outstanding objection/rejection has been overcome. Withdrawal thereof is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 1-3, 5-10, 13-15 and 18-20 stand rejected under 35 U.S.C. §103(a) as being obvious over **Pfohl et al.** (USP 4,978,427)(“Pfohl ‘427”) in view of **Auhorn et al.** (USP 4,908,240) (“Auhorn ‘240”) as evidenced by **Pfalz et al.** (USP 6,800,675)(“Pfalz ‘675”) or **DeWacker et al.** (USP 4,940,741) (“DeWacker ‘741”).

Legal Standard for Determining Prima Facie Obviousness

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally,

the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.” *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

“In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. “The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The Supreme Court of the United States has recently held that the teaching, suggestion, motivation test is a valid test for obviousness, but one which cannot be too rigidly applied. See *KSR Int’l Co. v Teleflex Inc.*, 127 S. Ct. 1727 (2007).

The Supreme Court in *KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007) reaffirmed the Graham factors in the determination of obviousness under 35 U.S.C. § 103(a). The four factual inquiries under Graham are:

- (a) determining the scope and contents of the prior art;
- (b) ascertaining the differences between the prior art and the claims in issue;
- (c) resolving the level of ordinary skill in the pertinent art; and
- (d) evaluating evidence of secondary consideration.

Graham v. John Deere, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

The Court in *KSR Int'l Co. v. Teleflex, Inc.*, *supra.*, did not totally reject the use of "teaching, suggestion, or motivation" as a factor in the obviousness analysis. Rather, the Court recognized that a showing of "teaching, suggestion, or motivation" to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. § 103(a).

Even so, the Court in *KSR Int'l Co. v. Teleflex, Inc.*, *ibid.*, rejected a rigid application of the "teaching, suggestion, or motivation" (TSM) test, which required a showing of some teaching, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the prior art elements in the manner claimed in the application or patent before holding the claimed subject matter to be obvious.

Discussion of the Present Invention

The presently claimed invention is directed to a papermaking method that utilizes a polymer emulsion comprising polymer particles (B) containing vinyl monomer units containing 94.66 to 100 wt. % of vinyl fatty ester units. The claimed invention further requires adding the polymer emulsion to a pulp slurry, at the time of papermaking. It is advantageous that the polymer emulsion is easy to adhere on the surface of pulp and polymers retain on pulp, providing an excellent improvement of stiffness, when water is drained with wire mesh. The polymer emulsions in the claimed inventions also comprise components (A) or (A') being a cationic compound, which have a good affinity with pulp, providing the above noted advantages, as discussed in the specification, at page 4, line 17, to page 5, line 13. Generally, the surface of pulp is negatively charged.

Discussion of the Cited Prior Art

In the outstanding Office Action at page 3, last paragraph, the Examiner has taken the position that the total of 90 mol-% of vinyl acetate and 10 mol-% of vinyl formamide is 100 mol-% and then the amount of vinyl acetate is 94.7% by weight. However, Applicants respectfully submit that the Examiner's calculation is erroneous.

The molecular weight of vinyl acetate is 86.1 and the molecular weight of vinyl formamide is 71.1. Thus, the mole ratio of 90:10 is the weight ratio of $(90 \times 86.1) : (10 \times 71.1) = 91.6 : 8.4$. 91.6% by weight is the actual vinyl acetate amount in Pfohl '427, which is outside of the claimed range of 94.66 to 100% by weight.

In the examples of Pfohl '427, when vinyl acetate and vinyl formamide are copolymerized and the formyl group is eliminated from the copolymer, vinyl acetate is hydrolyzed, as shown in col. 4, lines 57-58 and col. 5 lines 5-6. The copolymer in Pfohl '427 is a water-soluble copolymer, as shown in the Abstract, even in suspension or a dispersion copolymerization. It is estimated that the water-solubility of the copolymer increases via hydrolysis. Accordingly, the product is not in the form of a suspension or dispersion. Pfohl '427 recites at col. 1, lines 51-58, that a hydrolyzed vinyl acetate is especially useful. Pfohl '427 cites vinyl acetate as an example of a particularly useful water-soluble copolymer at column 2, line 29. For this reason, when the copolymer of vinyl acetate is added to a pulp slurry, the copolymer is different from the polymer of the present invention.

The present invention does not use a water-soluble polymer, but rather a polymer emulsion. The polymer emulsion is easy to adhere on the surface of pulp when it is mixed with a pulp slurry. When water is drained with a wire mesh, the polymer adheres on the surface of pulp, not washed out, being retained on the surface of pulp. This provides the superior and unexpected improvement of increased stiffness.

In the examples of Pfohl '427, after polymerization of vinyl acetate and formamide (col. 4, lines 44-66), a white paste is obtained and is dispersed in water and hydrolyzed without any stabilizer or emulsifier (col. 4, lines 49-51). By the hydrolysis after polymerization, the water solubility of the polymer is increased. Thus, the polymer is water-soluble. Thus, since the product is distributed as a result of the water-solubility of the polymer, a stabilizer or emulsifier is unnecessary. For this reason, Pfohl '427 does not teach or suggest using a stabilizer or emulsifier.

On the other hand, Auhorn '240 discloses a cationic and/or nonionic emulsifier at col. 2, line 68. Auhorn '240 also discloses an anionic starch as an aqueous solution thereof at col. 6, line 4. There is no teaching or recognition of the benefit of using a cationic starch.

The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art, and all teachings in the prior art must be considered to the extent that they are in analogous arts. Where the teachings of two or more prior art references conflict, the examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another. *In re Young*, 927 F.2d 588, 18 USPQ2d 1089 (Fed. Cir. 1991).

Applicants respectfully submit that one of ordinary skill in the art would not modify Pfohl '427 in the manner suggested by the Examiner because Pfohl '427 teaches away from the suggested combination. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

Even assuming, *arguendo*, that the compositions of Pfohl '427 and Auhorn '240 are similar, the amount of vinyl acetate in both is outside of the scope of the presently claimed invention, being 91.6% by weight or less and 80% by weight or less, respectively. Thus, even if the compositions of the cited art are combined with each other, they still do not arrive at the presently claimed invention.

Moreover, Applicants have surprisingly discovered the superior advantages associated with using a cationic compound, such as (A) or (A'). In support of the patentability of the present invention, Applicants submit herewith a **Declaration Under 37 C.F.R. § 1.132 by Zembei MEIWA** (hereinafter "the Meiwa Declaration"). The Meiwa Declaration demonstrates the superiority in stiffness ratio and bulk ratio when using a cationic starch instead of an amphoteric starch. It is clear from Table 5, the column "Performance of manufactured paper" that those examples containing cationic starch perform far better than those with amphoteric starch.

Evidence of unobvious or unexpected advantageous properties, such as superiority in a property the claimed compound shares with the prior art, can rebut *prima facie* obviousness. "Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness." *In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987). MPEP § 716.02(a).

The Examiner turns to Pfalz '675 and DeWacker '741 as evidence that the use of cationic starch as a protective colloid, stabilizer and emulsifier is well known in the art (*See* the Office Action, page 4, paragraph 2). Pfalz '675 discloses a neutral, cationic, anionic, amphoteric and amphiphilic as starch, col. 5, lines 1-3 and col. 9, lines 5-13. DeWacker '741 discloses an anionic or cationic starch, col. 3, lines 45-47. Neither of these references recognizes the superior benefits of using a cationic starch.

However, as explained above, the composition of Pfohl '427 does not require the use of a stabilizer or emulsifier, and Applicants submit that Pfohl '427 teaches away from so doing because of the desired water-solubility of the polymer used therein. Furthermore, even though the Examiner takes the position that using cationic starch is conventionally known in the art, "[a] statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993)." Thus, even the consideration of Pfalz '675 and DeWacker '741 does not serve to render the presently claimed invention obvious.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the outstanding rejection.

In view of the foregoing, Applicants believe the pending application is in condition for allowance. A Notice of Allowance is earnestly solicited.

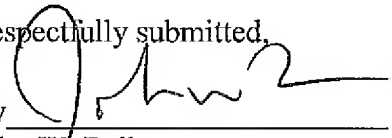
Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Monique T. Cole, Reg. No. 60,154 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 
MTZ John W. Bailey
Registration No.: 32,881
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant

Attachment: 37 CFR § 1.132 Declaration of Zembei MEIWA